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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/511,597	07/07/2005	Chantal Louis	261201US0PCT	5567
22850	7590	07/11/2008	EXAMINER	
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			NGUYEN, TAM M	
			ART UNIT	PAPER NUMBER
			1797	
			NOTIFICATION DATE	DELIVERY MODE
			07/11/2008	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/511,597	<b>Applicant(s)</b> LOUIS ET AL.	
	<b>Examiner</b> TAM M. NGUYEN	<b>Art Unit</b> 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03 April 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Amendment***

The rejection of claims 1-10 under 35 USC § 112 is withdrawn by the examiner in view of the amendment filed on April 03, 2008

The rejections of claims 1-10 under 35 USC § 102(b) and 103(a) by EP-056324 A1 are withdrawn by the examiner in view of the amendment filed on April 3, 2008.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 5, 6, 11, 12, and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Han et al. (US 2005/0109677).

Han discloses a desulfurization process by contacting a hydrocarbon fuel stream (e.g., kerosene) with an organic hydroperoxide in the presence of a sulfur oxidation catalyst do convert organosulfur compounds to sulfur oxide (e.g., sulfones). The sulfones are then removed from the treated stream by contacting the stream with an adsorbent comprising alumina-silica. Since the adsorbent comprising majority of alumina-silica, it would be expected that the adsorbent

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comprises more than 60 wt. % of silica-alumina. (See abstract; [0015], [0016], [0017], [0018], [0022])

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 4-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Funakoshi et al. (EP-056324 A1).

Funakoshi disclose a method of removing organic sulfur compounds from liquid oil. The oil is contacted with an oxidizing agent (e.g., hydrogen peroxide) in an oxidation zone followed by a stage of removing the oxidized sulfur compounds by adsorption on an adsorbent solid. Funakoshi also discloses that the adsorbent comprise 50 wt. % of alumina. (See abstract; page 3, lines 3-11, 47-52; page 7, line 7)

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 1, 4, 5, 6, 10-13, 16, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Funakoshi (EP-056324 A1) in view of Ueda et al. (US 5,306,682)

Funakoshi disclose a method of removing organic sulfur compounds from liquid oil (e.g., kerosene). The oil is contacted with an oxidizing agent (e.g., hydrogen peroxide) in an oxidation zone followed by a stage of removing the oxidized sulfur compounds by adsorption on an adsorbent solid. Funakoshi also discloses that the adsorbent comprise 50 wt. % of alumina. (See abstract; page 3, lines 3-11, 19-20, 47-52; page 7, line 7)

Funakoshi does not disclose that the adsorbent comprising silica-alumina.

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Ueda disclose a process for moving sulfur oxides from a hydrocarbon stream by contacting the stream with adsorbent comprising silica-alumina. See col. 4, lines 37-55.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Funakoshi by utilizing the silica-alumina adsorbent of Ueda because such adsorbent is effective to remove sulfur oxides.

Funakoshi does not specifically disclose that the adsorbent has mesopores.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Funakoshi/Ueda by utilizing an adsorbent having mesopores size because it is within the level of skill in the art to use an adsorbent having an appropriate pore size including mesopores.

Ueda does not specifically disclose the amount of alumina in the silica-alumina adsorbent as claimed.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Ueda by utilizing the an adsorbent having the amount of alumina as claimed because it is within the level of one of skill in the art to utilize any amount of alumina including the claimed amount.

Funakoshi does not specifically disclose that the feedstock is from hydrodesulfurization process.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Funakoshi by using the feedstock from a hydrodesulfurization process because any feedstock that contains sulfur compounds can be

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successfully treated in the process of Funakoshi including feed that from a hydrodesulfurization process.

Claims 2, 3, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Funakoshi (EP-056324 A1) and Ueda (U.S 5,306,682) as applied to claim 1 above, and further in view of Chapados et al. "Desulfurization by Selective Oxidation and Extraction of Sulfur-containing Compounds to Economically Achieve Ultra-low Proposed Diesel Fuel Sulfur Requirements" March 26-28-2000.

The process of Funakoshi is as discussed above.

Funakoshi does not specifically disclose that the hydrocarbon feed comprises less than or equal to 80% by weight of aromatics.

Chapados discloses a hydrocarbon feedstock comprises less than 80 wt. % of aromatics as claimed. (See table 3)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Funakoshi by utilizing a feedstock comprising less than 80 wt. % of aromatics as taught by Chapados because of the similarities between the feed of Funakoshi and the feed of Chapados. It would be expected that the feedstock of Chapados would be effectively treated in the process of Chapados.

Since the similarities between the modified process of Funakoshi and the claimed process in terms of feedstock and oxidation process, it would be expected that the hydrocarbon mixture before entering to the adsorption zone would have a sulfur content as claimed.

Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over references as applied to claim 1 above, and further in view of either Tsybulevskiy et al. (US 2002/009404 A1) or Frye et al. (U.S. 6,531,052).

The process of Funakoshi is as discussed above.

Funakoshi does not disclose that the adsorbent comprises at least one solid of crystalline structure in the amount of less than or equal to 40 % by weight.

Tsybulevskiy discloses an adsorbent for removal of sulfur compounds wherein the adsorbent comprises Y or X zeolite. (See abstract)

Frye discloses a process for removal of sulfur species by utilizing an adsorbent comprising about 50-95 wt. % of alumina and about 5-50 wt. % of zeolite-Y. The adsorbent has a surface area greater than 200 m<sup>2</sup>/g. Frye further discloses that the adsorbent details in Fleming et al. (U.S. 4,762,537) which teaches that the adsorbent has a surface area greater of 450 m<sup>2</sup>/g. (See col. 2, lines 1-20)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Funakoshi by utilizing an adsorbent comprising alumina/silica and zeolite (which is taught by Tsybulevskiy) because it is prima facie obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition which is to be used for the very same purpose. *In re Kerkhoven* 205 USPQ 1069 (CCPA 1980).

Alternatively, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Funakoshi et al. by utilizing an



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adsorbent comprising alumina/silica and zeolite as taught by Frye because such adsorbent is effective to remove sulfur compounds from a hydrocarbon feed.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tam M. Nguyen whose telephone number is (571) 272-1452. The examiner can normally be reached on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TN

/Tam M. Nguyen/

Primary Examiner, Art Unit 1797

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